CLAIMS

What is claimed is:

1. A method for assaying a sample for the presence of a target molecule comprising:

providing a liquid sample suspected of comprising the target molecule;

contacting the sample with a filter, said filter comprising a sensor molecule attached thereto, said sensor molecule capable of specifically binding to the target molecule, if present;

passing the sample transversely through said filter using a pressure-controlling apparatus under conditions that allow the sensor molecule to bind to the target molecule;

recovering the remaining liquid sample; and

determining whether the target has bound to the sensor.

2. The method of claim 1, wherein the sample is selected from the group consisting of blood; urine; semen; milk; sputum; mucus; plueral fluid; pelvic fluid; sinovial fluid; ascites fluid; a body cavity wash; eye brushing; skin scrapings; a buccal swab; a vaginal swab; a pap smear; a rectal swab; an aspirate; a needle biopsy; a section of tissue; plasma; serum; spinal fluid; lymph fluid; an external secretion of the skin, respiratory, intestinal, or genitourinary tract; tears; saliva; a tumor; an organ; a microbial culture; and an *in vitro* cell culture constituent.

3. The method of claim 1, wherein the sensor comprises an antibody.

4. The method of claim 1, wherein the sensor comprises a polynucleotide.

5. The method of claim 1, wherein the sensor comprises a peptide nucleic acid.

6. The method of claim 1, wherein a plurality of different sensors are attached to the filter, wherein each of said plurality can selectively bind to a corresponding different target.

7. The method of claim 1, wherein the target is a cell surface molecule.

8. The method of claim 1, wherein the target is a soluble molecule.

9. The method of claim 1, wherein the target is membrane-bound.

10. The method of claim 1, wherein the target is DNA.

11. The method of claim 1, wherein the target is RNA.

12. The method of claim 1, wherein the target is from a pathological organism.

13. The method of claim 1, wherein the target is a viral marker.

14. The method of claim 1, further comprising comparing a result from said determining to a result obtained from a control sample.

15. The method of claim 14, where the control sample is a positive control.

16. The method of claim 14, where the control sample is a negative control.

17. The method of claim 1, further comprising washing said sample prior to said determining.

18. The method of claim 1, wherein the sample comprises a water-soluble alcohol in an amount effective to preserve the sterility of the solution toward at least one contaminant.

19. The method of claim 1, wherein determining whether the target has bound to the sensor comprises contacting the filter with a labeled secondary sensor, and determining whether label is associated with the filter.

20. The method of claim 19, wherein the first label comprises an agent selected from a chromophore, a lumiphore, a fluorophore, a chromogen, a hapten, an antigen, a radioactive isotope, a magnetic particle, a metal nanoparticle, an enzyme, an antibody or binding portion or equivalent thereof, an aptamer, and one member of a binding pair.

21. The method of claim 20, wherein the agent is an enzyme selected from alkaline phosphatase, horseradish peroxidase, β-galactosidase, glucose oxidase, a bacterial luciferase, an insect luciferase and sea pansy luciferase.

22. The method of claim 20, wherein the agent is a fluorophore.

23. The method of claim 22, wherein the fluorophore is a semiconductor nanocrystal.

24. The method of claim 23, wherein the fluorophore is a fluorescent dye.

25. The method of claim 20, wherein the agent is an enzyme, and a chemiluminescent substrate is used to detect the presence of agent.